REMARKS

A. Request for Reconsideration

Applicants have carefully considered the matters raised by the Examiner in the outstanding Office Action but remain of the position that patentable subject matter is present. Applicants respectfully request reconsideration of the Examiner's position based on the Information Disclosure Statement, the amendments to the drawings, the amendments to the specification, the amendments to the claims and the following remarks.

B. The Invention

The present invention is directed to a method for producing a stimulable phosphor, a radiation image converting panel having the stimulable phosphor produced by the method (product-by-process) and a method for producing the radiation image converting panel having the stimulable phosphor.

In one of the novel aspects of the invention, the method for producing the stimulable phosphor includes the steps of forming a CsBr:Eu precursor with an emulsified layer method by mixing an aqueous solution containing Cs ions, Br ions and Eu ions, an organic solvent having a different solubility for the ions and a surface active agent.

In another novel aspect of the invention, the method for producing the stimulable phosphor includes the steps of forming an aqueous phase of Cs, Br and Eu ions and adding an organic phase and a surface active agent to the aqueous phase.

Radiation image converting panels having the stimulable phosphor produced by the methods of the present invention exhibit little delayed luminance, superior luminance unevenness, high luminance, high sharpness and are produced at low cost.

C. Claim Status and Amendments

Claims 1-18 are presented for further prosecution. Claims 11-18 have been added by this amendment.

Method claims 7 and 8 have been rewritten in independent form. Product claims 1-6, 9 and 10 have been amended to be ultimately dependent upon method claim 7, and claims 11-18, which mirror claims 1-6, 9 and 10, have been added to be dependent upon claim 8. No new matter has been added by these amendments.

Claim 7 has also been amended to replace "(ii)" with "(iii)".

D. Information Disclosure Statement

The Examiner had stated that the listing of references in the specification is not a proper Information Disclosure Statement and the listed references have not been considered unless cited on form PTO-892.

Applicants have enclosed form PTO/SB/08A to cite the references disclosed on pages 1-6 of the specification. Copies of the Japanese publications have been provided along with English Abstracts of the publications themselves or of equivalent publications. It is noted that an English Abstract or English equivalent of JP-62-110200 could not be obtained. Applicants respectfully request consideration of the cited publications. It is deemed that JP 10-140148 and JP 10-265774 are the most relevant, both of which are cited on page 6 of the application.

E. Drawing Objections and Amendments

The drawings had been objected to because the abbreviation "FIG. 1" was used to identify the sole Figure. Applicants have provided a replacement Figure which does not contain this abbreviation.

F. Specification Amendments

Applicants have amended pages 11, 28 and 29 of the application to replace "FIG. 1" with "the drawing" as a result of the amendment to the drawings.

The cooling temperature for Sample II-4 in Table II on page 44 of the application has been changed from "501" to "50" °C. This necessity for this amendment is believed to be obvious based on the cooling temperatures of the remaining Samples in Table II.

Pages 49-51 of the application have been amended to refer to Samples IV-1 through "IV-7" since Table IV on page 54 contains 7 Samples.

G. Claim Objections

Claim 5 had been objected to for containing a typographical error. Applicants have corrected this error.

H. Claim Rejections under 35 USC § 103(a)

Claims 1-9 had been rejected as being unpatentable over Shimada (US 5,028,509) in view of Riman (US 6,699,406) and Hampden-Smith (US 6,210,604). Claim 10 had been rejected as being unpatentable over Shimada in view of Riman, Hampden-Smith and Takahashi (US 4,926,047).

Shimada had been cited to teach a radiation image converting panel having a support, a stimulable phosphor layer containing a polymer and a stimulable phosphor. Riman had been cited to teach a stimulable phosphor produced by sublimation. Hampden-Smith had been cited to teach a spherical stimulable phosphor. Takahashi had been cited to teach heating a coated stimulable phosphor and polymer layer to dry the layer. With regard to claims 7 and 8, Riman had been cited to teach a method for producing a stimulable phosphor by precipitating the phosphor particles from an aqueous solution of rare earth element ions, halide-forming metal ions and an organic solvent.

1. Riman does not teach or suggest forming a CsBr:Eu precursor using a surface active agent

Claims 7 and 8 require the use of a surface active agent to form the phosphor precursor. Specifically, claim 7 recites a method for producing a stimulable phosphor including the step of mixing an aqueous solution containing Cs ions, Br ions and Eu ions with an organic solvent having a different solubility for the ions and with a surface active agent. Claim 8 recites a method for producing a stimulable phosphor including the step of adding an organic phase and a surface active agent to an aqueous phase containing Cs ions, Br ions and Eu ions. The surface active agent of claims 7 and 8 perform a vital function, namely,

enhancing the dispersiveness of the stimulable phosphor particles (page 23, lines 18-20).

Riman does not teach or suggest forming a precursor using a surface active agent. In col. 5, lines 28-67 cited by the Examiner, Riman explains that the precursor is produced from an aqueous solution of rare earth element ions and halide-forming ions. The solution is stirred and the particles are precipitated by adding a polar organic solvent. The precipitates are washed and centrifuged. In contrast to the present invention, Riman does not employ a surface active agent.

Applicants respectfully submit that the methods of claims 7 and 8 are not taught or suggested by Riman and the remaining cited references.

2. Table I of the application demonstrates the criticality of producing the stimulable phosphor using an organic solvent and a surface active agent

Table I on page 39 of the application demonstrates that a superior radiation image converting panel is obtained when the stimulable phosphor is produced from an organic solvent and a surface active agent.

The stimulable phosphor of Samples I-1 was produced by mixing an aqueous solution liquid phase with a liquid film phase of EDTA (surface active agent) and isopropyl alcohol (page 34, line 15 to page 35, line 7). The stimulable phosphors of Samples I-2 to I-9 were produced in the same manner as Sample I-1, except that ratio of the aqueous phase to the organic phase was changed and the kinds of organic solvents were changed while the surface active agent remained the same (page 36, lines 3-8). Samples I-1 to I-9 were used to produce radiation image converting panels and the panels were evaluated for luminance, sharpness (MTF), luminance unevenness and delayed luminance as described on pages 36-38 of the application. The evaluation results are shown in Table I on page 39.

As shown in Table I, Samples I-1 to I-8 having a stimulable phosphor produced using an organic solvent and a surface active agent are superior to Sample I-9 having a stimulable phosphor produced without using an organic solvent and a surface active agent. Specifically, Samples I-1 to I-8 had improved luminance, improved sharpness, improved luminance unevenness and improved delayed luminance unevenness compared to Sample I-9.

Table I therefore demonstrates the criticality of producing the stimulable phosphor using an organic solvent and a surface active agent. Riman and the remaining cited references do not teach or suggest producing the phosphor using a surface active

agent. Thus, based on the showing in Table I, Applicants respectfully submit that the present invention is not obvious over the teachings of the cited references taken alone or in combination.

F. Conclusion

In view of the foregoing and the enclosed, it is respectfully submitted that the application is in condition for allowance and such action is respectfully requested. Should any extensions of time or fees be necessary in order to maintain this Application in pending condition, appropriate requests are hereby made and authorization is given to debit Account # 02-2275.

Respectfully submitted,

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Encl: PTO/SB/08A (two sheets) with cited references
One replacement sheet of drawings
Return receipt postcard

DRAWING AMENDMENTS

The attached sheet includes changes to the drawing. This sheet replaces the sheet including the original drawing.

Attachment: Replacement Sheet